

# DNA evidence during trial

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**A**lthough relatively new, DNA evidence has become one of the most frequently adduced types of evidence during a criminal trial. Because of the high cogency it is extremely important that results of DNA examination of crime stains and subject samples are presented in a proper way and that the expert witness who adduces the evidence does not comment on points he is not entitled to during his.

In advance of the trial the prosecution should disclose to the accused all the evidence on which the prosecution is to rely to secure conviction. As provided by s 13(1) of the Criminal Procedure and Investigations Act 1996 (CPIA) the prosecution are obliged to comply with primary disclosure under s 3 as soon as reasonably possible after the accused has been committed for trial. In addition to disclosure of the evidence which will be used by the prosecutor against the defendant, s 3(1) of the CPIA stipulates that the prosecutor must disclose to the accused any prosecution material which has not previously been disclosed to the accused and which might reasonably be considered capable of undermining the case for the prosecution against the accused or of assisting the case for the accused. In making the decision as to the disclosure, the prosecutor has to consider whether this evidence could be used by the defence to undermine

the prosecution case in cross-examination or suggest an explanation or partial explanation of the accused's actions.

The examples of material that might reasonably be considered capable of undermining the prosecution case or of assisting the case for the accused are, among others, any material casting doubt upon the accuracy of any prosecution evidence, any material that might go to the credibility of a prosecution witness, any material that might support a defence that is either raised by the defence or apparent from the prosecution papers and any material which may have a bearing on the admissibility of any prosecution evidence. They should include DNA profiles and reports which were not used by the prosecution, information about the proficiency of the forensic laboratory, genetic information about the relatives of the accused who may be reasonably believed to have committed the crime in question and the information on the competence and qualification of the DNA prosecution expert witness to name just a few. In preparation for the case the defence need to know whether or not as a result of examination DNA profiles from the crime samples were obtained, what was the result of comparison between these profiles and the DNA profile of the defendant and why the prosecution do not intend to adduce DNA evidence at the trial. It has to be remembered that the absence

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of evidence is not the evidence of absence. If a DNA profile which was obtained from a crime scene does not match that of the defendant it is powerful evidence in supporting the defendant's case which the jury have to consider in reaching the verdict (*R v Mitchell [2004] The Times, 8 July*). It should also be borne in mind that while items taken in isolation may not be reasonably considered being capable of undermining the prosecution case or assisting the accused, several items together can have that effect.

DNA evidence which the prosecution intends to adduce at the trial typically conforms to a format devised by the FSS although statements provided by other laboratories may show minor variations. The statement dealing with DNA analysis usually contains the name, expertise, experience and qualifications of the expert, the list of items received for examination, the information given to the scientist about the alleged circumstances of the case, the purpose of examination, various technical issues, results and conclusions.

Where the expertise was performed by a team of scientists this should be clearly stated in the statement and the contribution of each member of the team indicated. Usually this is provided separately from the statement in a Forensic Examination Record which is neither a statement nor an exhibit and is served separately.

It is paramount for successful defence that during the preparation period for the trial the defence team includes an expert on interpretation of DNA evidence. In some cases the defence may employ several experts who are specialists in various aspects of DNA evidence such as DNA technology or statistical interpretation of results of DNA testing. Even, when the probative value of DNA evidence seems to be very high it is still necessary to have it examined by a DNA expert who may be able to identify weak points or even faults in methodology or statistical approaches used by prosecution scientists for evaluation of DNA evidence.

Being a specialised area of knowledge, DNA evidence needs to be properly explained to the jury. This is done by a scientist who was either personally involved in obtaining the evidence or personally supervised the team of scientists who produced the data. The purpose of the expert is to provide the jury with the information which is outside the scope of their knowledge to help them to form the opinion on issues linking the defendant and the scene of crime.

In England and Wales the guidelines for presenting DNA evidence in court were laid out in the ruling of *R v Doheny and Adams [1997] 1 Cr.App. R. 369*:

1. The scientist should adduce the evidence of the DNA comparisons between the crime stain and the defendant's sample together with his calculations of the random occurrence ratio [although this is the requirement laid out in the ruling, the use of random occurrence ratio to express the strength of DNA evidence is erroneous - the correct index which must be reported by the scientist is Random Match Probability. UK forensic scientists recognise the difference between these indices and correctly report Random Match Probability in their statements]

2. Whenever DNA evidence is to be adduced the Crown should serve on the defence details as to how the calculations have been carried out which are sufficient to enable the defence to scrutinise the basis of the calculations.

3. The Forensic Science Service should make available to a defence

expert, if requested, the databases upon which the calculations have been based.

4. Any issue of expert evidence should be identified and, if possible, resolved before trial. This area should be explored by the court in the pre-trial review.

5. In giving evidence the expert will explain to the jury the nature of the matching DNA characteristics between the DNA in the crime stain and the DNA in the defendant's blood sample.

6. The expert will, on the basis of empirical statistical data, give the jury the random occurrence ratio - the frequency with which the matching DNA characteristics are likely to be found in the population at large.

7. Provided that the expert has the necessary data, it may then be appropriate for him to indicate how many people with the matching characteristics are likely to be found in the United Kingdom or a more limited relevant sub-group, for instance, the Caucasian, sexually active males in the Manchester area.

8. It is then for the jury to decide, having regard to all the relevant evidence, whether they are sure that it was the defendant who left the crime stain, or whether it is possible that it was left by someone else with the same matching DNA characteristics.

9. The expert should not be asked his opinion on the likelihood that it was the defendant who left the crime stain, nor when giving (p. 370) evidence should he use terminology which may lead the jury to believe that he is expressing such an opinion.

10. It is inappropriate for an expert to expound a statistical approach to evaluating the likelihood that the defendant left the crime stain, since unnecessary theory and complexity deflect the jury from their proper task.

11. In the summing-up careful directions are required in respect of any issues of expert evidence and guidance should be given to avoid confusion caused by areas of expert evidence where no real issue exists.

12. The judge should explain to the jury the relevance of the random occurrence ratio in arriving at their verdict and draw attention to the extraneous evidence which provides the context which gives that ratio its significance, and to that which conflicts with the conclusion that the defendant was responsible for the crime stain.

13. In relation to the random occurrence ratio, a direction along the following lines may be appropriate, tailored to the facts of the particular case:

"Members of the jury, if you accept the scientific evidence called by the Crown this indicates that there are probably only four or five white males in the United Kingdom from whom that semen stain could have come. The defendant is one of them. If that is the position, the decision you have to reach, on all the evidence, is whether you are sure that it was the defendant who left that stain or whether it is possible that it was one of that other small group of men who share the same DNA characteristics."

When assessing DNA evidence (as well as other type of evidence) in criminal proceedings the problem the law has to confront is the extent to which experts are allowed to influence the jury's decision on disputed issues. The issues which belong to the domain of the jury, the ultimate issues, upon which the final verdict will depend, have to be clearly separated in the mind of the expert from those on which he is entitled to give an opinion. The ultimate issues are unacceptable at common law to be commented on by an expert witness. These issues are ultimately for the jury to decide according to the standard of proof determined by law. The expert must not abuse his position, deliberately or inadvertently, by expressing opinion on the matters he is not entitled to nor should he be asked to express such an opinion.

In relation to DNA evidence specific ultimate issues are following (the list is by far not exhaustive and there may be some other issues depending on the circumstance of a specific case):

- Whether or not the accused is the source of DNA found in the crime stain

From the legal standpoint, it is in the realm of the jury to decide whether or not the accused is the source of the DNA from the crime stain sample and consequently whether or not the accused was at the scene when the crime was committed. In arriving to this decision the jury base their conclusion on vast amount of evidential information provided to them by the prosecution and defence. Even more importantly, the jury possess the means of verifying this


information. The forensics scientist does not have access to any of this. He cannot be sure whether or not the background information about the case which was provided to him by police is true and does not have any means to check this.

- the personal opinion of the expert as to the weight of DNA evidence expressed in a non-numerical way using a verbal scale (eg. extremely strong support, strong support, moderate support etc )

When presenting the results using the verbal scale, the wording express either a personal opinion of the scientist on the strength of the support to one of the hypothesis or the personal opinion of the scientist who developed this verbal scale. This contravenes the above rules of presenting DNA evidence in court. When a scientist expresses the strength of the scientific support he appears to be commenting on the ultimate issue which in most cases is whether or not the accused is the source of the crime stain.

- whether as a results of a specific act the accused left his/her DNA at the scene of crime

Even in cases when there is strong indication as to the identity of donor of DNA found in a crime sample how the DNA was deposited is not the domain of the expert to be commenting on. For example, female DNA found on penile swab of a male suspected of rape or indecent assault could have resulted from a vaginal, anal, and oral intercourse as well as been transferred there using hands if the male touched alleged victims genitals first and then used the same hand to



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masturbate himself. The forensic scientist does not have all necessary information to be able to comment on how the DNA from the alleged victim had found its way onto his penile shaft.

- the size of the relevant population (i.e. the population the perpetrator comes from)

It is not in the domain of the forensic scientist to express his opinion on the likelihood of someone to commit the crime in question and, consequently to be included in the population relevant to the case. The idea about the type, size and boundaries of the relevant population (sex of the offender, his/her age, location etc) is formed in the minds of the jury based on the evidence adduced prior to DNA evidence. This evidence is not available to the forensic scientist making him in no position to comment on the size of the relevant population.

- the number of people who potentially could contribute their DNA to the crime sample (as opposed to giving the minimum number of contributors to the DNA mixture based on the results of DNA analysis)

The scientist could estimate the number of contributors to a DNA mixture by analysing the number of peaks and their morphology. However, the jury is in the position to know how many people have been at the scene of crime and consequently can estimate the number of people who could have potentially contributed to the mixture. Usually, when reporting results of mixture evaluation forensic scientists give the number of potential contributors in the form of "no less than", thus indicating the minimum number of the individuals who could potentially have contributed their DNA to the mixture.

- the likelihood of error during examination of DNA evidence

It is for the jury to decide whether or not the results of DNA analysis have been affected by a laboratory or other error taking into consideration the information about the types of laboratory and reporting errors possible in each particular case, the genotyping error rate of a particular laboratory (if it is available, ideally the results of external blind proficiency tests) and the effect of errors on probative value of DNA evidence.

Should the prosecution expert during the testimony express an opinion on the subject he is not entitled to the defence may find it appropriate to ask the judge to instruct the jury to disregard this part of the expert's testimony or even apply for the evidence to be ruled inadmissible.

The expert witness should provide his opinion comprehensively and in an unbiased manner. In formulating his opinion the expert may often need to rely on certain facts pertinent to the case as well as refer to various extraneous sources of information (eg articles and data published in scientific journals) to justify his opinion. When the expert has to rely on the facts resulting from the case these facts have to be proved by admissible evidence. Otherwise, the evidence is inadmissible under the hearsay rule (R v Loveridge [2001] EWCA Crim 734).

The rules laid out in R v Doheny and Adams [1997] 1 Cr.App. R. 369 clearly indicate that the expert "should not be asked his opinion on the likelihood that it was the defendant who left the crime stain nor when giving evidence ... use terminology which may lead the jury to believe that he is expressing such an

opinion". Unfortunately, many expert witness statements contain expressions of personal opinion of the scientist. If the scientist decides to provide such an opinion in his report it should be only for the purpose of informing the prosecution and the defence on his personal opinion regarding the strength of evidence against the accused. It is typically put in brackets within the Conclusion section of the statement with a disclaiming note similar to this one:

"My opinion on the source of the DNA is provided here for the benefit of the prosecution and defence. In the event of a non guilty plea, all words within these square brackets should be deleted from my statement to avoid contravening the Court of Appeal ruling in R v. Doheny and Adams (1997)."

When the report contains personal opinion of the expert on the strength of DNA evidence this opinion should never be allowed to be aired in court as it will contravene the decision of the Court of Appeal. If the prosecuting expert during his testimony expresses a personal opinion on the strength of evidence the defence should make an application to the judge to instruct the jury to disregard this part of the expert's testimony.

After DNA evidence has been adduced the defence may challenge it on one or several points. This may be done during the cross-examination of the prosecution expert or the evidence may be challenged by defence's own expert evidence.

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